EXHIBIT B

TO

COMPLAINT

U.S. Patent No. 11,618,352

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(12) **United States Patent**
Friedman

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(54) **LOCKING HARNESS**

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(60) Continuation of application No. 16/946,833, filed on Jul. 8, 2020, now abandoned, which is a continuation
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(51) **Int. Cl.**
B60N 2/28 (2006.01)
B60R 22/10 (2006.01)
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(52) **U.S. Cl.**
CPC ***B60N 2/2812*** (2013.01); ***B60N 2/2803*** (2013.01); ***B60R 22/105*** (2013.01);
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(58) **Field of Classification Search**
None
See application file for complete search history.

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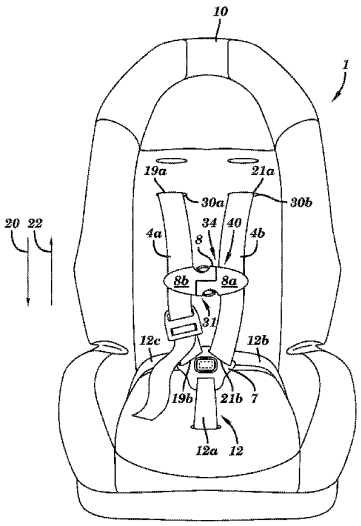
(57) **ABSTRACT**

A retainer apparatus including a first retainer portion, a second retainer portion, a wireless transceiver, and a sensor contained within at least one of the first retainer portion and the second retainer portion. The retainer apparatus includes the first retainer portion configured to be slidably attached to a first harness strap and a second retainer portion configured to be slidably attached to a second harness strap. The first retainer portion is removably attached to the second retainer portion. The sensor is configured to detect the first retainer portion being disconnected from the second retainer portion and generate a warning signal. The wireless transceiver is configured to wirelessly transmit the warning signal to a controller in a vehicle to activate an audible warning alert to warn a user in the vehicle of the first retainer portion being disconnected from the second retainer portion.

19 Claims, 7 Drawing Sheets



Related U.S. Application Data

of application No. 16/273,291, filed on Feb. 12, 2019, now Pat. No. 10,710,545, which is a division of application No. 15/602,294, filed on May 23, 2017, now Pat. No. 10,259,423, which is a continuation of application No. 14/984,232, filed on Dec. 30, 2015, now Pat. No. 9,669,797, which is a continuation of application No. 14/481,016, filed on Sep. 9, 2014, now Pat. No. 9,561,776, which is a division of application No. 13/653,540, filed on Oct. 17, 2012, now Pat. No. 8,851,575, which is a division of application No. 12/703,227, filed on Feb. 10, 2010, now Pat. No. 8,333,433.

(51) **Int. Cl.**

B60R 22/12	(2006.01)
B60R 22/36	(2006.01)
B60R 22/48	(2006.01)

(52) **U.S. Cl.**

CPC ***B60R 22/12*** (2013.01); ***B60R 22/36*** (2013.01); ***B60R 22/48*** (2013.01); *A44D 2200/12* (2013.01); *B60N 2002/2815* (2013.01); *Y10S 24/38* (2013.01); *Y10T 24/4012* (2015.01); *Y10T 24/45529* (2015.01); *Y10T 29/49826* (2015.01)

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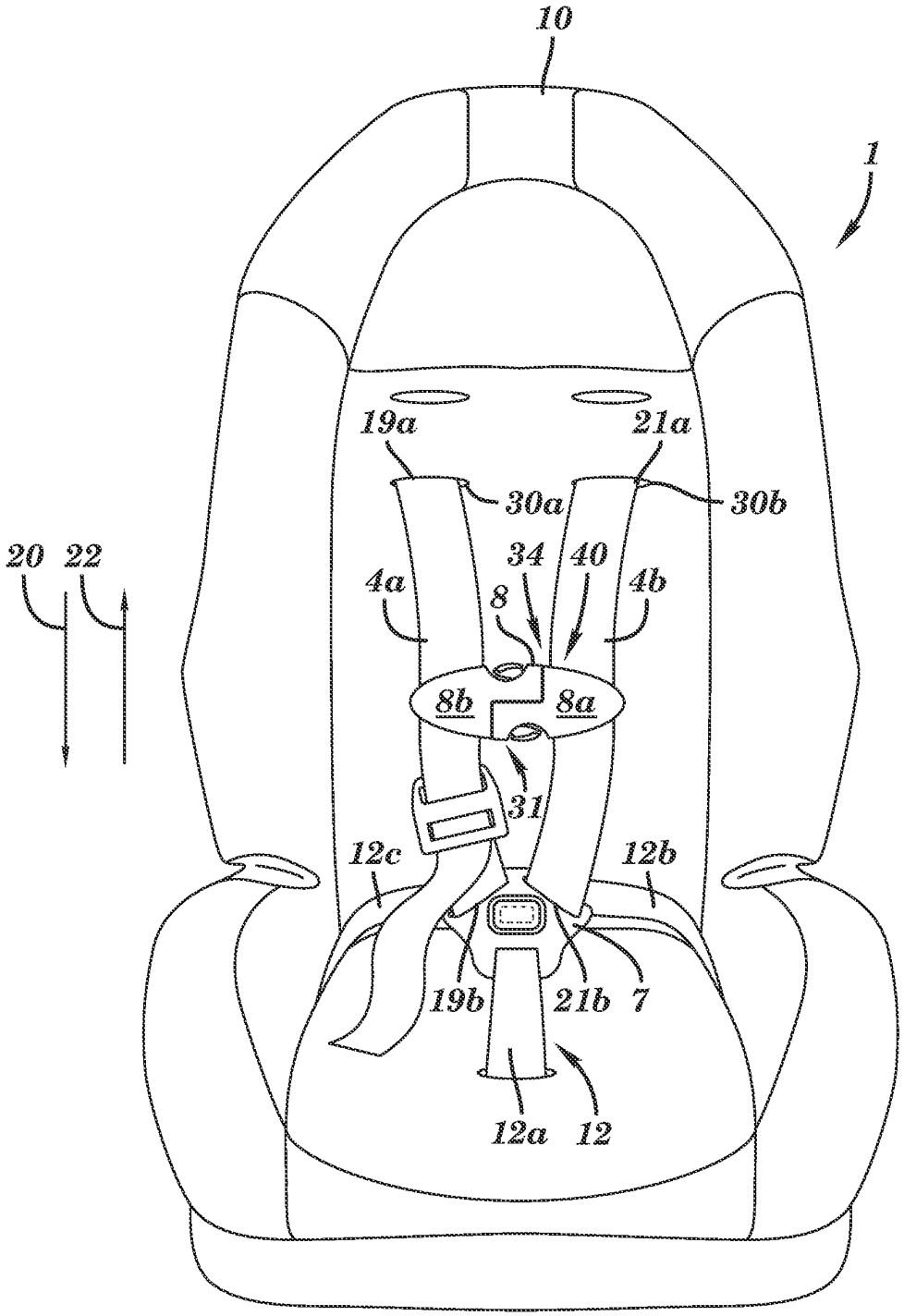
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12b
19b
21b
7
12a
12

FIG. 1

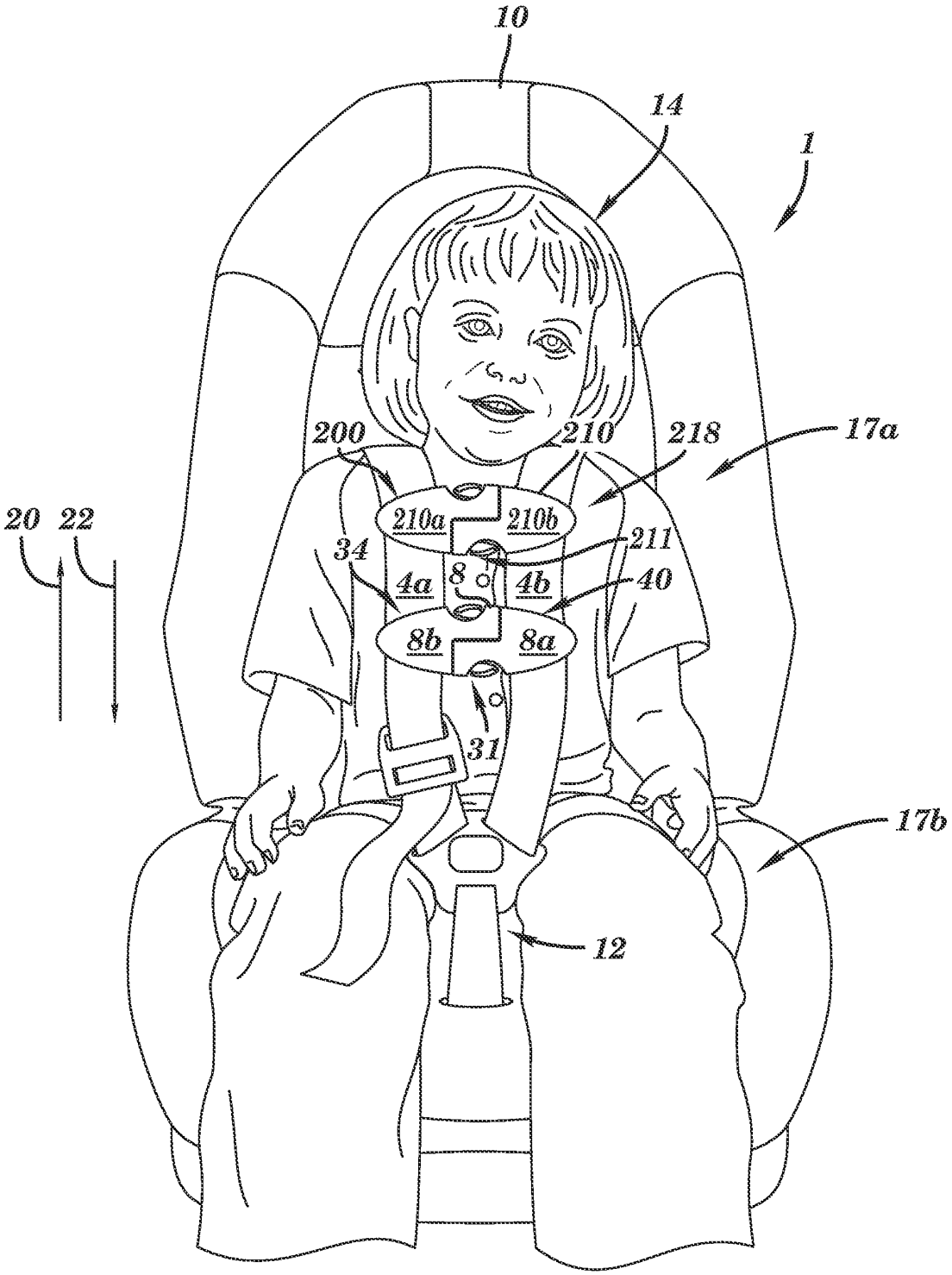
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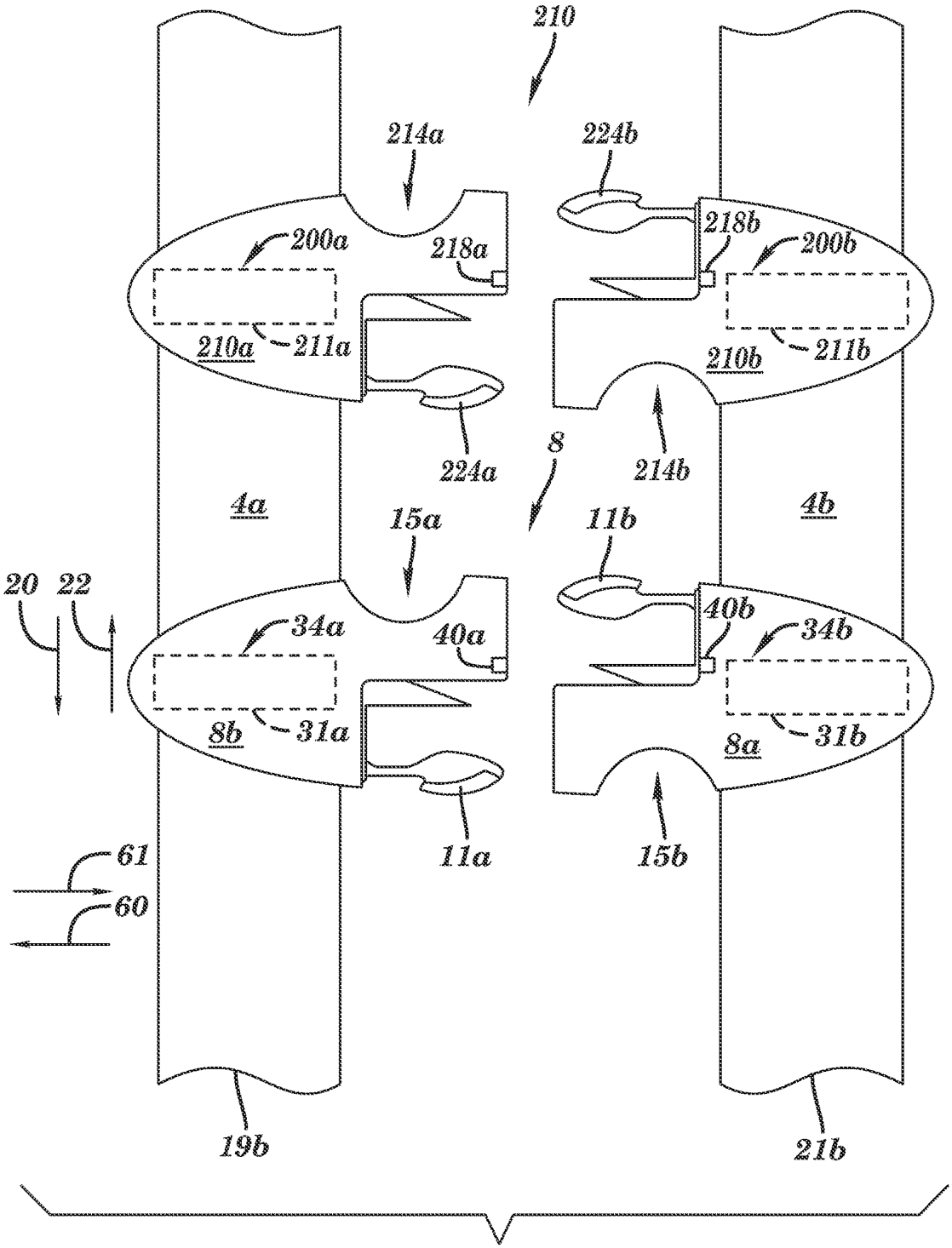
FIG. 2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31b
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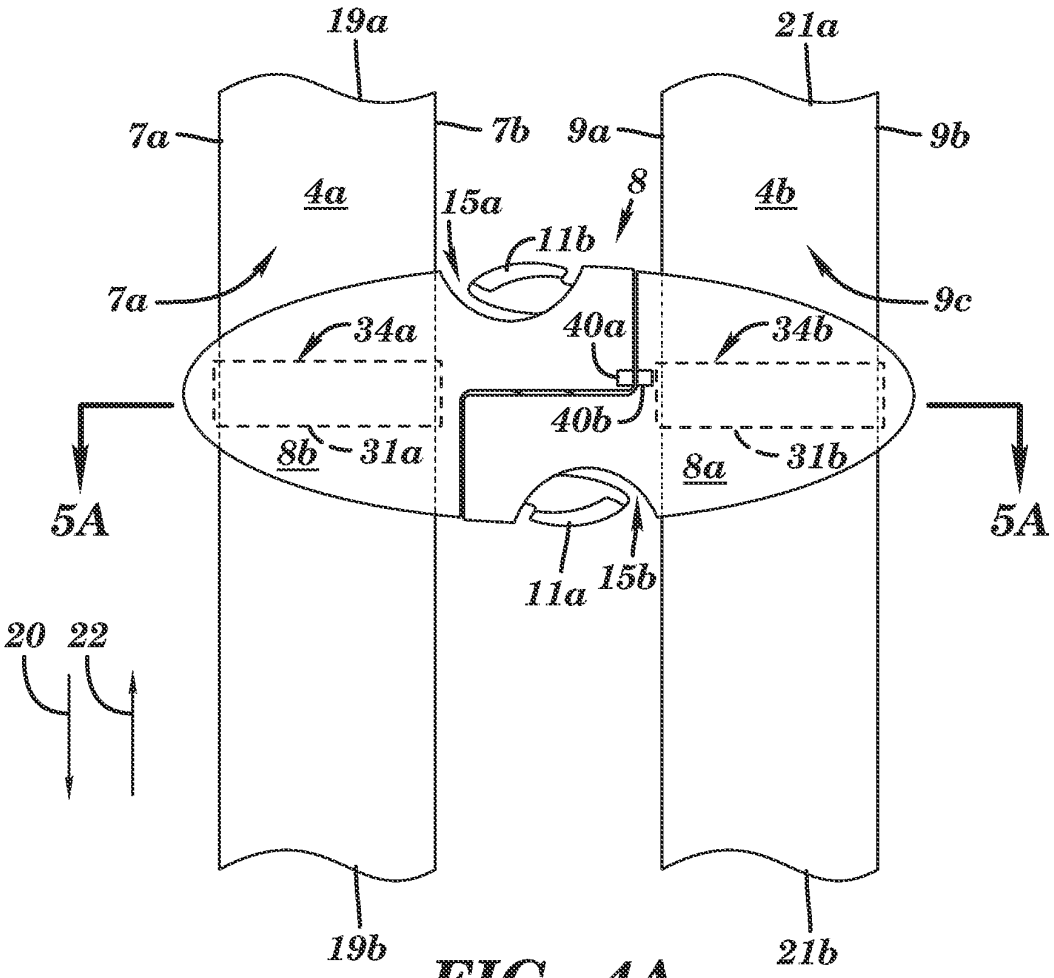
15b
19b
21b

FIG. 3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11a
15b
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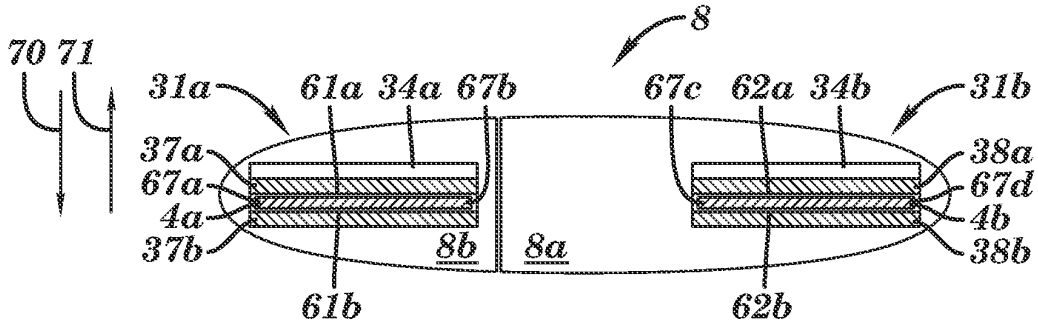
22
19b
21b

FIG. 4A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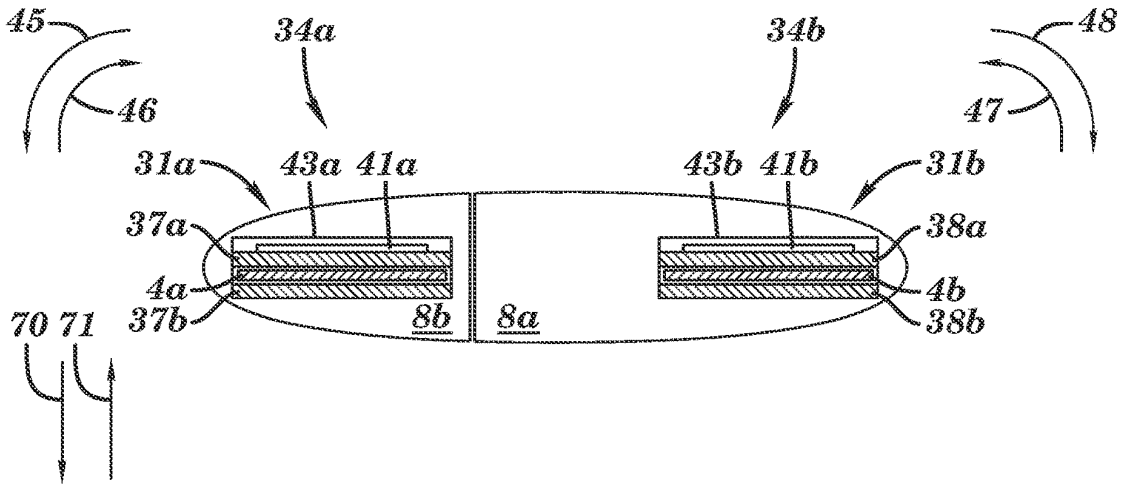
4b
38b
8b
8a
61b
62b

FIG. 4B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38b

FIG. 4C

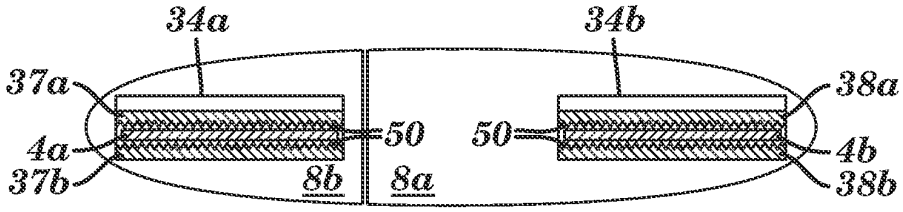
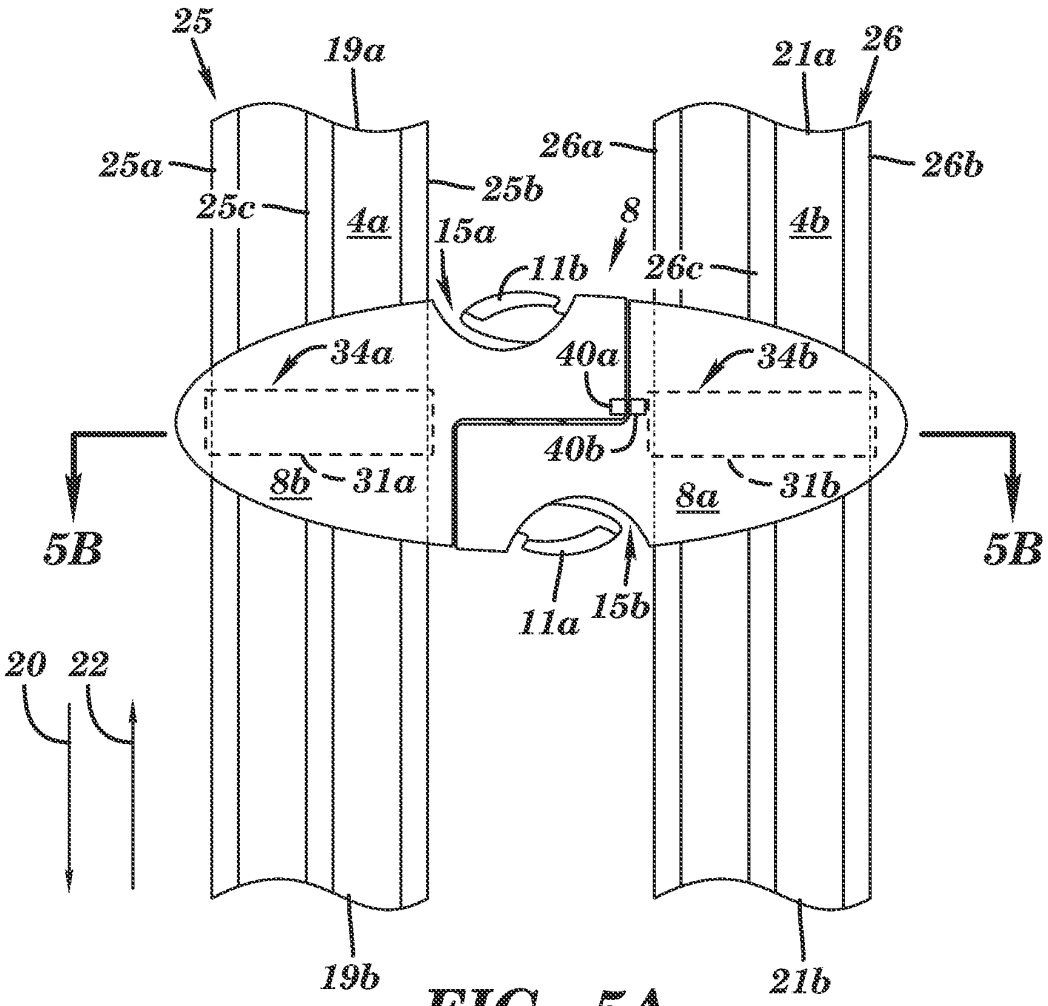


FIG. 4D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25c
25b
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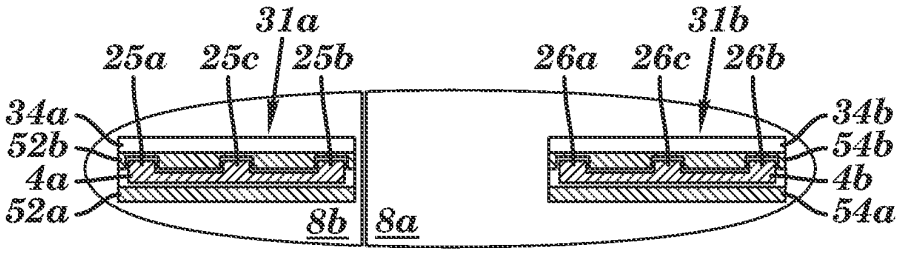
8a
31b
5B
5B
11a
15b
20
22
19b
21b

FIG. 5A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25c
25b
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26c
26b
34a
52b
4a
52a
34b
54b
4b
54a
8b
8a

FIG. 5B

LOCKING HARNESS

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a continuation application claiming priority to Ser. No. 16/946,833 filed Jul. 8, 2020, which is a continuation of Ser. No. 16/273,291 filed Feb. 12, 2019, now U.S. Pat. No. 10,710,545 issued Jul. 14, 2020, which is a divisional application claiming priority to Ser. No. 15/602,294 filed on May 23, 2017 now U.S. Pat. No. 10,259,423 issued Apr. 16, 2019, which is a continuation application claiming priority to Ser. No. 14/984,232 filed Dec. 30, 2015, now U.S. Pat. No. 9,669,797 issued Jun. 6, 2017 which is a continuation application claiming priority to Ser. No. 14/481,016 filed Sep. 9, 2014, now U.S. Pat. No. 9,561,776 issued Feb. 7, 2017 which is a divisional application claiming priority to Ser. No. 13/653,540 filed Oct. 17, 2012, now U.S. Pat. No. 8,851,575 issued Oct. 7, 2014 which is a divisional application of Ser. No. 12/703,227 filed Feb. 10, 2010, and entitled "Locking Harness Apparatus and Method", now U.S. Pat. No. 8,333,433, issued Dec. 18, 2012.

FIELD OF TECHNOLOGY

The present invention relates to a locking restraint apparatus and associated method for restraining an individual in a vehicle for preventing motion related injuries.

BACKGROUND

Restraining users during travel typically comprises an inefficient process with little flexibility. Accordingly, there exists a need in the art to overcome at least some of the deficiencies and limitations described herein above.

SUMMARY

The present invention provides a retainer apparatus comprising: a first retainer portion configured to be slidably attached to a first adjustable harness strap of a car seat; a second retainer portion configured to be slidably attached to a second adjustable harness strap of the car seat, wherein the first retainer portion is directly and removably attached to the second retainer portion; a wireless transceiver contained within at least one of the first retainer portion and the second retainer portion; and a sensor contained within at least one of the first retainer portion and the second retainer portion, wherein the sensor is configured to detect the first retainer portion being disconnected from the second retainer portion and generate a warning signal indicating the first retainer portion being disconnected from the second retainer portion, and wherein the wireless transceiver is configured to wirelessly transmit the warning signal to a controller in a vehicle to activate an audible warning alert to warn a user in the vehicle of the first retainer portion being disconnected from the second retainer portion.

The present invention provides a retainer apparatus comprising: a first retainer portion removably attached to a second retainer portion, wherein the first retainer portion is configured to be slidably attached to a first adjustable harness strap of a car seat, and wherein the second retainer portion is configured to be slidably attached to a second adjustable harness strap of the car seat; a wireless transceiver contained within at least one of the first retainer portion and the second retainer portion; and a sensor contained within at least one of the first retainer portion and the second retainer portion, wherein the sensor is configured to detect the first retainer portion being disconnected from the second retainer portion and generate a warning signal indicating the first retainer portion being disconnected from the second retainer portion, wherein the wireless transceiver is configured to wirelessly transmit the warning signal to a controller in a vehicle to activate an audible warning alert to warn a user in the vehicle of the first retainer portion being disconnected from the second retainer portion.

The present invention provides a method comprising: removably attaching a first retainer portion, slidably attached to a first adjustable harness strap of a car seat, to a second retainer portion slidably attached to a second adjustable harness strap of the car seat, wherein the first retainer portion and the second retainer portion are comprised by a retainer apparatus; detecting, by a sensor contained within at least one of the first retainer portion and the second retainer portion, the first retainer portion being disconnected from the second retainer portion; generating, by the sensor, a warning signal indicating the first retainer portion being disconnected from the second retainer portion; and wirelessly transmitting, by a wireless transceiver within the surface of at least one of the first retainer portion and the second retainer portion, the warning signal to a controller in a vehicle to activate an audible warning alert to warn a user in the vehicle of the first retainer portion being disconnected from the second retainer portion.

The present invention advantageously provides a simple apparatus and associated method capable of restraining users during travel.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** illustrates a locking restraint apparatus for safely restraining an individual during travel in a vehicle, in accordance with embodiments of the present invention.

FIG. **2** illustrates the restraint apparatus of FIG. **1** safely restraining an individual during travel in a vehicle, in accordance with embodiments of the present invention.

FIG. **3** illustrates a close up view of the retainer apparatus **8** of FIG. **1** slidably attached to adjustable harness straps, in accordance with embodiments of the present invention.

FIG. **4**A illustrates an alternative to FIG. **3**, in accordance with embodiments of the present invention.

FIG. **4**B illustrates a cross sectional view of the retainer apparatus of FIG. **4**A, in accordance with embodiments of the present invention.

FIG. **4**C illustrates a first alternative cross sectional view of the retainer apparatus of FIG. **4**B, in accordance with embodiments of the present invention.

FIG. **4**D illustrates a second alternative cross sectional view of the retainer apparatus of FIG. **4**B, in accordance with embodiments of the present invention.

FIG. **5**A illustrates an alternative to FIG. **4**A, in accordance with embodiments of the present invention.

FIG. **5**B illustrates a cross sectional view of the retainer apparatus of FIG. **5**A, in accordance with embodiments of the present invention.

DETAILED DESCRIPTION

FIG. **1** illustrates a restraint apparatus **1** for safely restraining an individual (e.g., a person) during travel in a vehicle, in accordance with embodiments of the present invention. Restraint apparatus **1** may be used in any type of vehicle including, inter alia, an automobile, an aircraft, a boat, etc.

Restraint apparatus **1** comprises a seat structure **10** (e.g., a car seat), an adjustable harness strap **4***a*, an adjustable harness strap **4***b*, a retainer apparatus **8** slidably attached to adjustable harness strap **4***a* and adjustable harness strap **4***b*, and a harness portion **12**. Adjustable harness strap **4***a* and adjustable harness strap **4***b* are configured to restrain an upper body portion of a person (e.g., see upper body portion **17***a* child **14** in FIG. **2**, infra). An upper body portion (e.g., upper body portion **17***a* in FIG. **2**) is defined herein as any portion of a body located above (i.e., in direction **20**) a waist section (e.g., see waist section **17** in FIG. **2**, infra). Adjustable harness strap **4***a* is removably attached to seat structure **10**. Adjustable harness strap **4***a* extends from seat structure **10** through opening **30***a* to buckle structure **7**. Adjustable harness strap **4***a* is removably attached to buckle structure **7**. Adjustable harness strap **4***b* is removably attached to seat structure **10**. Adjustable harness strap **4***b* extends from seat structure **10** through opening **30***b* to buckle structure **7**. Adjustable harness strap **4***b* is removably attached to buckle structure **7**. Retainer apparatus **8** comprises a retainer portion **8***a*, a retainer portion **8***b*, a braking mechanism **31**, an optional motion detector/sensor/alarm apparatus **40**, and an optional electrical motor/signal receiving device **34**. Retainer portion **8***a* is slidably attached to harness strap **4***a*. Retainer portion **8***b* is slidably attached to harness strap **4***b*. Retainer apparatus **8** is configured to slidably move along harness strap **4***a* and harness strap **4***b* in a direction **20** and **22** and between ends **19***a* and **19***b* of harness strap **4***a* and ends **21***a* and **21***b* of harness strap **4***b*. Braking mechanism **31** is configured to adjustably prevent retainer portion **8***a* and retainer portion **8***b* from slidably moving along **4***a* harness strap and harness strap **4***b*. Braking mechanism **31** is configured to hold retainer portion **8***a* and retainer portion **8***b* at any stationary position along harness strap **4***a* and harness strap **4***b*. Braking mechanism **31** is configured to hold retainer portion **8***a* at any stationary position between portion **19***a* and portion **19***b* of harness strap **4***a*. Braking mechanism **31** is configured to hold retainer portion **8***b* at any stationary position between portion **21***a* and portion **21***b* of harness strap **4***b*. Retainer portion **8***a* is removably attached to retainer portion **8***b* (e.g., using clips **11***a* and **11***b* removably attached to openings **15***a* and **15***b* respectively as illustrated in FIGS. **3** and **4**A, infra). Braking mechanism **31** comprises a braking device(s) (e.g. devices **37***a*, **37***b*, **38***a*, and **38***b* in FIG. **4**B as described, infra) for applying resistance to harness strap **4***a* and/or harness strap **4***b* for holding retainer apparatus **8** in any stationary position along harness strap **4***a* and harness strap **4***b*. Optional electrical motor/signal receiving device **34** may comprise a signal receiving/transmitting device (e.g., a wireless transceiver) and/or an electrical motor or solenoid. Optional electrical motor/signal receiving device **34** is configured to accept a control signal (i.e., via a signal receiving/transmitting device) from a control device (e.g., a computer/controller in a vehicle) and automatically (e.g., in accordance with the control signal enabled by a user) slidably move (i.e., using an electrical motor) retainer apparatus **8** along harness strap **4***a* and harness strap **4***b* in direction **20** and/or **22** until a disable control signal is received by the signal receiving/transmitting device. Alternatively, optional electrical motor/signal receiving device **34** may be configured to accept a control signal (i.e., via a signal receiving/transmitting device) from a control device (e.g., a computer/controller in a vehicle) and automatically (e.g., in accordance with the control signal enabled by a user) slidably move (i.e., using an electrical motor) retainer apparatus **8** along harness strap **4***a* and harness strap **4***b* (i.e., in direction **20** and/or **22**) a predetermined or specified distance (e.g., data comprising specified distances may be stored within a memory structure located within retainer apparatus **8** and/or a computer/controller in a vehicle). Optional motion detector sensor/alarm apparatus **40** may comprise a motion detector and/or an alarm. The motion detector detects any movement of retainer apparatus **8** (e.g., in direction **20** or **22**, retainer portion **8***a* disconnected from retainer portion **8***b*, etc.) and either activates a warning alarm located within sensor/alarm apparatus **40** or transmits a warning signal to a computer/controller in a vehicle to warn a user (e.g., a driver) that movement of retainer apparatus **8** has been detected thereby allowing the user to re-secure an individual (e.g., a child) in restraint apparatus **1**. Harness portion **12** comprises a first portion **12***a*, a second portion **12***b*, and a third portion **12***c* mechanically attached (i.e., removably or not removably) to buckle structure **7**. Harness portion **12** is configured to restrain a lower body portion of a person (e.g., see lower body portion **17***b* of child **14** in FIG. **2**, infra). A lower body portion (e.g., lower body portion **17***b* in FIG. **2**) is defined herein as any portion of a body located below (i.e., in direction **22**) a waist section (e.g., see waist section **17** in FIG. **2**, infra). Restraint apparatus **1** may additionally comprise an additional retainer apparatus(s) (i.e., not shown and similar to or the same as retainer apparatus **8** comprising braking mechanism **31**) slidably attached to adjustable harness strap **4***a* and adjustable harness strap **4***b* to provide additional restraint capabilities for restraint apparatus **1**.

FIG. **2** illustrates restraint apparatus **1** of FIG. **1** safely restraining an individual **14** during travel in a vehicle, in accordance with embodiments of the present invention. Individual **14** comprises a waist section **17** used to define an upper body portion **17***a* and a lower body portion **17***b*. Additionally, FIG. **2** illustrates an optional additional retainer apparatus(s) **210** (i.e., similar to retainer apparatus **8** as described with respect to FIG. **1**, supra) slidably attached to adjustable harness strap **4***a* and adjustable harness strap **4***b* to provide additional restraint capabilities for restraint apparatus **1**. Similar to retainer apparatus **8** of FIG. **1**, retainer apparatus **210** (of FIG. **2**) comprises a retainer portion **210***a*, a retainer portion **210***b*, a braking mechanism **211**, an optional motion detector/sensor/alarm apparatus **218**, and an optional electrical motor/signal receiving device **200**. Retainer portion **210***a* is slidably attached to harness strap **4***a*. Retainer portion **210***b* is slidably attached to harness strap **4***b*. Retainer apparatus **210** is configured to slidably move along harness strap **4***a* and harness strap **4***b* in directions **20** and **22**. Braking mechanism **211** is configured to adjustably prevent retainer portion **210***a* and retainer portion **210***b* from slidably moving along **4***a* harness strap and harness strap **4***b*. Braking mechanism **211** is configured to hold retainer portion **210***a* and retainer portion **210***b* at any stationary position along harness strap **4***a* and harness strap **4***b*. Retainer portion **210***a* is removably attached to retainer portion **210***b* (e.g., using clips **224***a* and **224***b* removably attached to openings **214***a* and **214***b* respectively as illustrated in FIG. **3**, infra). Optional electrical motor/signal receiving device **200** may comprise a signal receiving/transmitting device (e.g., a wireless transceiver) and/or an electrical motor or solenoid. Optional electrical motor/signal receiving device **200** is configured to accept a control signal (i.e., via a signal receiving/transmitting device) from a control device (e.g., a computer/controller in a vehicle) and automatically (e.g., in accordance with the control signal enabled by a user) slidably move (i.e., using an electrical motor) retainer apparatus **210** along harness strap **4***a* and harness strap **4***b* in direction **20** and/or **22** until a disable

control signal is received by the signal receiving/transmitting device. Alternatively, optional electrical motor/signal receiving device **200** may be configured to accept a control signal (i.e., via a signal receiving/transmitting device) from a control device (e.g., a computer/controller in a vehicle) and automatically (e.g., in accordance with the control signal enabled by a user) slidably move (i.e., using an electrical motor) retainer apparatus **210** along harness strap **4***a* and harness strap **4***b* (i.e., in direction **20** and/or **22**) a predetermined or specified distance (e.g., data comprising specified distances may be stored within a memory structure located within retainer apparatus **210** and/or a computer/controller in a vehicle). Optional motion detector sensor/alarm apparatus **218** may comprise a motion detector and/or an alarm. The motion detector detects any movement of retainer apparatus **210** (e.g., in direction **20** or **22**, retainer portion **210***a* disconnected from retainer portion **210***b*, etc.) and either activates a warning alarm located within sensor/alarm apparatus **218** or transmits a warning signal to a computer/controller in a vehicle to warn a user (e.g., a driver) that movement of retainer apparatus **210** has been detected thereby allowing the user to re-secure an individual (e.g., a child) in restraint apparatus **1**.

FIG. **3** illustrates a close up view of retainer apparatus **8** of FIG. **1** and optional retainer apparatus **210** of FIG. **2** slidably attached to adjustable harness strap **4***a* and adjustable harness strap **4***b*, in accordance with embodiments of the present invention. In FIG. **3**, retainer portion **8***a* is disconnected from retainer portion **8***b*. Retainer portion **8***a* is disconnected from retainer portion **8***b* by disabling using clips **11***a* and **11***b* from openings **15***a* and **15***b*, respectively. Retainer portion **8***a* is moved towards retainer portion **8***b* in a direction **60** and retainer portion **8***b* is moved towards retainer portion **8***a* in a direction **61** in order to latch clip **11***b* to opening **15***a* and latch clip **11***a* to opening **15***b* (i.e., as illustrated in FIG. **4**, infra). FIG. **3** additionally illustrates a close up view of braking mechanism **31** (i.e., comprising braking mechanism portions **31***a* and **31***b*), optional motion detector sensor/alarm apparatus **40** (i.e., comprising motion detector sensor/alarm apparatus portions **40***a* and **40***b*), and optional electrical motor/signal receiving device **34** (i.e., comprising electrical motor/signal receiving device portions **34***a* and **34***b*). Each of braking mechanism portion **31***a*, motion detector sensor/alarm apparatus portion **40***a*, and electrical motor/signal receiving device portion **34***a* is mechanically attached to retainer portion **8***a*. Each of braking mechanism portion **31***b*, motion detector sensor/alarm apparatus portion **40***b*, and electrical motor/signal receiving device portion **34***b* is mechanically attached to retainer portion **8***b*. Additionally, in FIG. **3**, retainer portion **210***a* is disconnected from retainer portion **210***b*. Retainer portion **210***a* is disconnected from retainer portion **210***b* by disabling clips **224***a* and **224***b* from openings **214***a* and **214***b*, respectively. Retainer portion **210***a* is moved towards retainer portion **210***b* in a direction **60** and retainer portion **210***b* is moved towards retainer portion **210***a* in a direction **61** in order to latch clip **224***b* to opening **214***a* and latch clip **224***a* to opening **214***b*. FIG. **3** additionally illustrates a close up view of braking mechanism **211** (i.e., comprising braking mechanism portions **211***a* and **211***b*), optional motion detector sensor/alarm apparatus **200** (i.e., comprising motion detector sensor/alarm apparatus portions **218***a* and **218***b*), and optional electrical motor/signal receiving device **200** (i.e., comprising electrical motor/signal receiving device portions **200***a* and **200***b*). Each of braking mechanism portion **211***a*, motion detector sensor/alarm apparatus portion **218***a*, and electrical motor/signal receiving device portion **200***a* is mechanically attached to retainer portion **210***a*. Each of braking mechanism portion **211***b*, motion detector sensor/alarm apparatus portion **218***b*, and electrical motor/signal receiving device portion **200***b* is mechanically attached to retainer portion **210***b*.

FIG. **4**A illustrates an alternative to FIG. **3**, in accordance with embodiments of the present invention. In contrast to FIG. **3**, FIG. **4**A illustrates retainer portion **8***a* removably attached to retainer portion **8***b* using clips **11***a* and **11***b* removably attached to openings **15***a* and **15***b*. Additionally, FIG. **4** illustrates cut away line **5**A-**5**A applicable to the cross sectional views of FIGS. **4**B-**4**D as described infra.

FIG. **4**B illustrates a cross sectional view of retainer apparatus **8** taken at cut away line **5**A-**5**A of FIG. **4**A, in accordance with embodiments of the present invention. FIG. **4**B illustrates a cross sectional view of retainer portions **8***a* and **8***b*, braking mechanism portions **31***a* and **31***b*, electrical motor/signal receiving device portions **34***a* and **34***b*, and adjustable harness straps **4***a* and **4***b*. Braking mechanism portion **31***a* comprises a first section **37***a* and a second section **37***b*. In order to engage braking mechanism portion **31***a*, first section **37***a* is moved in direction **70** until contact is made with surface **61***a* of adjustable harness strap **4***a* and second section **37***b* is moved in direction **71** until contact is made with surface **61***b* of adjustable harness strap **4***a*. First section **37***a* is locked to second section **37***b* (i.e., upon contact with adjustable harness strap **4***a* to prevent movement of retainer portion **8***b*) using any means including, inter alia, clips, locking devices, screws, spring loaded latches (e.g., as described with respect to FIG. **4**C, infra), magnetic means, an electro/mechanical device such as a solenoid or an electrical motor, etc. Additionally, first section **37***a*, surface **61***a*, second section **37***b*, and/or surface **61***b* may each include a frictional material (e.g., sandpaper type material, rubber, teeth (e.g., as illustrated in FIG. **4**D, infra), etc.) to create friction and cause resistance to movement. Alternatively, first section **37***a*, surface **61***a*, second section **37***b*, and/or surface **61***b* may each include a magnetic material (e.g., standard magnetic material, electromagnetic structure such as an electromagnet, etc.) to cause resistance to movement. The aforementioned contact and locking process causes a resistance to movement between adjustable harness strap **4***a* (i.e., on any portion of adjustable harness strap **4***a* such as edge sections **67***a* and **67***b* or any surface of adjustable harness strap **4***a*) and braking mechanism portion **31***a* thereby holding (or locking) retainer portion **8***b* in a stationary position at a user selected location anywhere on adjustable harness strap **4***a*. Braking mechanism portion **31***b* comprises a first section **38***a* and a second section **38***b*. In order to engage braking mechanism portion **31***b*, first section **38***a* is moved in direction **20** **70** until contact is made with surface **62***a* of adjustable harness strap **4***b* and second section **38***b* is moved in direction **71** until contact is made with surface **62***b* of adjustable harness strap **4***b*. First section **38***a* is locked to second section **38***b* (i.e., upon contact with adjustable harness strap **4***b* to prevent movement of retainer portion **8***a*) using any means including, inter alia, clips, locking devices, screws, spring loaded latches (e.g., as described with respect to FIG. **4**C, infra), magnetic means, a solenoid, etc. Additionally, first section **38***a*, surface **62***a*, second section **38***b*, and/or surface **62***b* may each include a frictional material (e.g., sandpaper type material, rubber, teeth (e.g., as illustrated in FIG. **4**D, infra), etc.) to create friction and cause resistance to movement. Alternatively, first section **38***a*, surface **62***a*, second section **38***b*, and/or surface **62***b* may each include a magnetic material (e.g., standard magnetic material, electromagnetic structure, etc.)

to cause resistance to movement. The aforementioned contact and locking process causes a resistance to movement between adjustable harness strap **4***b* (i.e., on any portion of adjustable harness strap **4***b* such as edge sections **67***c* and **67***d* or any surface of adjustable harness strap **4***b*) and braking mechanism portion **31***b* thereby holding (or locking) retainer portion **8***a* in a stationary position at user selected location anywhere on adjustable harness strap **4***b*.

FIG. **4**C illustrates a first alternative cross sectional view of retainer apparatus **8** of FIG. **4**B taken at cut away line **5**A-**5**A of FIG. **4**A, in accordance with embodiments of the present invention. In contrast to FIG. **4**B, braking mechanism portion **31***a* comprises a latch (compression) mechanism **43***a* and a spring assembly **41***a* and braking mechanism portion **31***b* comprises a latch (compression) mechanism **43***b* and a spring assembly **41***b*. Latch mechanism **43***a* and spring **41***a* (i.e., compressed) are used to lock (or latch) first section **37***a* to second section **37***b* (i.e., as illustrated in FIG. **4**C). In order to release first section **37***a* from second section **37***b*, latch mechanism **43***a* is disengaged from braking mechanism portion **31***a* and moved in a direction **46** thereby relieving pressure on first section **37***a* and second section **37***b* (and spring **41***a*). As latch mechanism **43***a* is moved in direction **46**, compressed spring **41***a* is decompressed aiding in movement of latch mechanism **43***a* (in direction **46**) and relieving pressure on first section **37***a* and second section **37***b*. The aforementioned process enables retainer portion **8***b* to slidably move along adjustable harness strap **4***a*. In order to lock or latch first section **37***a* to second section **37***b* (and enable braking mechanism portion **31***a*), latch mechanism **43***a* is moved in a direction **45** and locked to braking mechanism portion **31***a* thereby enabling pressure on first section **37***a* and second section **37***b* (and spring **41***a*). Latch mechanism **43***b* and spring **41***b* (i.e., compressed) are used to lock (or latch) first section **38***a* to second section **38***b* (i.e., as illustrated in FIG. **4**C). In order to release first section **38***a* from second section **38***b*, latch mechanism **43***b* is disengaged from braking mechanism portion **31***b* and moved in a direction **47** thereby relieving pressure on first section **38***a* and second section **38***b* (and spring **41***b*). As latch mechanism **43***b* is moved in direction **47**, compressed spring **41***b* is decompressed aiding in movement of latch mechanism **43***b* (in direction **47**) and relieving pressure on first section **38***a* and second section **38***b*. The aforementioned process enables retainer portion **8***a* to slidably move along adjustable harness strap **4***b*. In order to lock or latch first section **38***a* to second section **38***b* (and enable braking mechanism portion **31***b*), latch mechanism **43***b* is moved in a direction **48** and locked to braking mechanism portion **31***b* thereby enabling pressure on first section **38***a* and second section **38***b* (and spring **41***b*).

FIG. **4**D illustrates a second alternative cross sectional view of retainer apparatus **8** of FIG. **4**B taken at cut away line **5**A-**5**A of FIG. **4**A, in accordance with embodiments of the present invention. In contrast to FIG. **4**B, first section **37***a* and/or second section **37***b* of braking mechanism portion **31***a* each comprise teeth (or any other type of gripping structure) to lock first section **37***a* and second section **37***b* to adjustable harness strap **4***a* to prevent movement of retainer portion **8***b*. Additionally, first section **38***a* and/or second section **38***b* of braking mechanism portion **31***b* each comprise teeth (or any other type of gripping structure) to lock first section **38***a* and second section **38***b* to adjustable harness strap **4***b* to prevent movement of retainer portion **8***a*.

FIG. **5**A illustrates an alternative to FIG. **4**A, in accordance with embodiments of the present invention. In contrast to FIG. **4**A, adjustable harness strap **4***a* comprises a track apparatus **25** that includes tracks **25***a*-**25***c* and adjustable harness strap **4***b* comprises a track apparatus **26** that includes tracks **26***a*-**26***c*. Note that although FIG. **5**A illustrates track apparatus **25** comprising three tracks (tracks **25***a*-**25***c*) and track apparatus **26** comprising three tracks (tracks **26***a*-**26***c*), any number of tracks may be used. Track apparatus **25** enables retainer portion **8***b* to move along adjustable harness strap **4***a* (and tracks **25***a*-**25***c*). In order to disable movement of retainer portion **8***b*, braking mechanism portion **31***a* is enabled to cause resistance to movement between tracks **25***a*-**25***c* and braking mechanism **31***a* (e.g., braking mechanism comprises braking portions that grab tracks **25***a*-**25***c*) thereby holding (or locking) retainer portion **8***b* in a stationary position at a user selected location anywhere on adjustable harness strap **4***a*. Track apparatus **25** additionally enables electrical motor/signal receiving device portion **34***a* (i.e., an electrical motor portion) to ride along tracks **25***a*-**25***c* upon receiving a user command (i.e., for automatically adjusting a position of retainer portion **8***b*). Electrical motor/signal receiving device portion **34***a* (i.e., an electrical motor portion) may additionally be disabled to cause resistance to movement between tracks **25***a*-**25***c* and electrical motor/signal receiving device portion **34***a* to hold (or lock) retainer portion **8***b* in a stationary position at a user selected location anywhere on adjustable harness strap **4***a* (i.e., in addition to or instead of using braking mechanism portion **31***a*). Track apparatus **26** enables retainer portion **8***a* to move along adjustable harness strap **4***b* (and tracks **26***a*-**26***c*). In order to disable movement of retainer portion **8***a*, braking mechanism portion **31***b* is enabled to cause resistance to movement between tracks **26***a*-**26***c* and braking mechanism **31***b* (e.g., braking mechanism comprises braking portions that grab tracks **26***a*-**26***c*) thereby holding (or locking) retainer portion **8***a* in a stationary position at a user selected location anywhere on adjustable harness strap **4***b*. Track apparatus **26** additionally enables electrical motor/signal receiving device portion **34***b* (i.e., an electrical motor portion) to ride along tracks **26***a*-**26***c* upon receiving a user command (i.e., for automatically adjusting a position of retainer portion **8***a*). Electrical motor/signal receiving device portion **34***b* (i.e., an electrical motor portion) may additionally be disabled to cause resistance to movement between tracks **26***a*-**26***c* and electrical motor/signal receiving device portion **34***b* to hold (or lock) retainer portion **8***a* in a stationary position at a user selected location anywhere on adjustable harness strap **4***b* (i.e., in addition to or instead of using braking mechanism portion **31***b*). Tracks **25***a*-**25***c* and **26***a*-**26***c* may comprise any type of or shaped track including, inter alia, vertical type tracks, rectangular shaped tracks, triangular shaped tracks, circular shaped tracks, a zipper type track, etc. Tracks **25***a*-**25***c* and **26***a*-**26***c* may comprise any type of material including, inter alia, plastic, metal, magnetic, a frictional material, etc. Additionally, FIG. **5**A illustrates cut away line **5**B-**5**B applicable to the cross sectional view of FIG. **5**B as described, infra.

FIG. **5**B illustrates a cross sectional view of retainer apparatus **8** taken at cut away line **5**B-**5**B of FIG. **5**A, in accordance with embodiments of the present invention. FIG. **5**B illustrates a cross sectional view of retainer portions **8***a* and **8***b*, braking mechanism portions **31***a* and **31***b*, electrical motor/signal receiving device portions **34***a* and **34***b*, tracks **25***a*-**25***c* and **26***a*-**26***c*, and adjustable harness straps **4***a* and **4***b*. Braking mechanism portion **31***a* comprises a first section **52***a* and a second section **52***b*. In order to engage braking mechanism portion **31***a*, second section **52***b* (i.e., comprising braking devices on vertical sections of second section **52***b*) is enabled such that pressure is applied (i.e., by the braking

devices (e.g., spring loaded braking devices, solenoid driven braking devices, etc.) on vertical sections of second section **52***b*) to vertical sections of each of tracks **25***a*-**25***c* thereby causing a resistance to movement between tracks **25***a*-**25***c* (of adjustable harness strap **4***a*) and braking mechanism portion **31***a* (i.e., the braking devices on vertical sections of second section **52***b*) thereby holding (or locking) retainer portion **8***b* in a stationary position at a user selected location anywhere on adjustable harness strap **4***a*. Alternatively, second section **52***b* may comprise magnetic structures (e.g., electro/magnetic structures) on vertical sections of second section **52***b* and tracks **25***a*-**25***c* comprise a metallic material capable of attraction to a magnetic field. In this case, engaging braking mechanism portion **31***a* includes enabling the electro/magnetic structures on vertical sections of second section **52***b* to generate a magnetic field thereby causing the electro/magnetic structures to magnetically hold the electro/magnetic structures to tracks **25***a*-**25***c*. The aforementioned process holds (or locks) retainer portion **8***b* in a stationary position at a user selected location anywhere on adjustable harness strap **4***a*. Braking mechanism portion **31***b* comprises a first section **54***a* and a second section **54***b*. In order to engage braking mechanism portion **31***b*, second section **54***b* (i.e., comprising braking devices (e.g., spring loaded braking devices, solenoid driven braking devices, etc.) on vertical sections of second section **54***b*) is enabled such that pressure is applied (i.e., by the braking devices on vertical sections of second section **54***b*) to vertical sections of each of tracks **26***a*-**26***c* thereby causing a resistance to movement between tracks **26***a*-**26***c* (of adjustable harness strap **4***b*) and braking mechanism portion **31***b* (i.e., the braking devices on vertical sections of second section **54***b*) thereby holding (or locking) retainer portion **8***a* in a stationary position at a user selected location anywhere on adjustable harness strap **4***b*. Alternatively, second section **54***b* may comprise magnetic structures (e.g., electro/magnetic structures) on vertical sections of second section **54***b* and tracks **26***a*-**26***c* comprise a metallic material capable of attraction to a magnetic field. In this case, engaging braking mechanism portion **31***b* includes enabling the electro/magnetic structures on vertical sections of second section **54***b* to generate a magnetic field thereby causing the electro/magnetic structures to magnetically hold the electro/magnetic structures to tracks **26***a*-**26***c*. The aforementioned process holds (or locks) retainer portion **8***a* in a stationary position at a user selected location anywhere on adjustable harness strap **4***b*.

While embodiments of the present invention have been described herein for purposes of illustration, many modifications and changes will become apparent to those skilled in the art. Accordingly, the appended claims are intended to encompass all such modifications and changes as fall within the true spirit and scope of this invention.

What is claimed is:

1. A retainer apparatus comprising:

a first retainer portion configured to be slidably attached to a first adjustable harness strap of a car seat;

a second retainer portion configured to be slidably attached to a second adjustable harness strap of the car seat, wherein said first retainer portion is directly and removably attached to said second retainer portion;

a wireless transceiver physically contained within at least one of said first retainer portion and said second retainer portion; and

a sensor physically contained within at least one of said first retainer portion and said second retainer portion, wherein said sensor is configured to detect said first retainer portion being disconnected from said second retainer portion and generate a warning signal indicating said first retainer portion being disconnected from said second retainer portion, and wherein said wireless transceiver is configured to wirelessly transmit said warning signal to a controller in a vehicle to activate an audible warning alert to warn a user in said vehicle of said first retainer portion being disconnected from said second retainer portion.

2. The retainer apparatus of claim **1**, wherein said sensor is entirely contained within a surface of at least one of said first retainer portion and said second retainer portion.

3. The retainer apparatus of claim **1**, wherein a portion of said sensor is coplaner with a surface of at least one of said first retainer portion and said second retainer portion.

4. The retainer apparatus of claim **1**, wherein said sensor comprises a first sensor portion and a second sensor portion, wherein said first sensor portion is contained within a first surface of said first retainer portion, and wherein said second portion is contained within a second surface of said second retainer portion.

5. The retainer apparatus of claim **1**, wherein said first retainer portion comprises a shape that is symmetrical with respect to said second retainer portion.

6. The retainer apparatus of claim **1**, wherein said sensor is in mechanical contact with at least one of said first retainer portion and said second retainer portion.

7. The retainer apparatus of claim **1**, wherein said retainer apparatus, said first adjustable harness strap and said second adjustable harness strap are comprised by a harness apparatus mechanically attached to said car seat, and wherein said harness apparatus is configured to restrain an occupant of said car seat and prevent said occupant from being ejected from said car seat.

8. The retainer apparatus of claim **1**, further comprising said car seat.

9. The retainer apparatus of claim **1**, wherein said first retainer portion is configured to clip to said second retainer portion for attachment.

10. The retainer apparatus of claim **1**, wherein said sensor is configured to generate said warning signal in response to a motion of said first retainer portion being disconnected from said second retainer portion.

11. The retainer apparatus of claim **1**, wherein said sensor is configured to generate said warning signal directly in response to said first retainer portion being disconnected from said second retainer portion.

12. The retainer apparatus of claim **1**, wherein said sensor is contained within an interior portion of at least one of said first retainer portion and said second retainer portion.

13. The retainer apparatus of claim **1**, wherein said sensor comprises a motion detector.

14. The retainer apparatus of claim **1**, wherein said controller is integral with said vehicle.

15. The retainer apparatus of claim **1**, wherein said controller is in the possession of said user in said vehicle.

16. The retainer apparatus of claim **1**, wherein said audible warning alert enables said user in said vehicle to re-secure an individual being restrained by said retainer apparatus.

17. A retainer apparatus comprising:

a first retainer portion removably attached to a second retainer portion, wherein said first retainer portion is configured to be slidably attached to a first adjustable harness strap of a car seat, and wherein said second retainer portion is configured to be slidably attached to a second adjustable harness strap of the car seat;

a wireless transceiver physically contained within at least one of said first retainer portion and said second retainer portion; and

a sensor physically contained within at least one of said first retainer portion and said second retainer portion, wherein said sensor is configured to detect said first retainer portion being disconnected from said second retainer portion and generate a warning signal indicating said first retainer portion being disconnected from said second retainer portion, wherein said wireless transceiver is configured to wirelessly transmit said warning signal to a controller in a vehicle to activate an audible warning alert to warn a user in said vehicle of said first retainer portion being disconnected from said second retainer portion.

18. The retainer apparatus of claim **17**, wherein said controller is in the possession of said user in said vehicle.

19. A method comprising:

removably attaching a first retainer portion, slidably attached to a first adjustable harness strap of a car seat, to a second retainer portion slidably attached to a second adjustable harness strap of the car seat, wherein said first retainer portion and said second retainer portion are comprised by a retainer apparatus;

detecting, by a sensor physically contained within at least one of said first retainer portion and said second retainer portion, said first retainer portion being disconnected from said second retainer portion;

generating, by said sensor, a warning signal indicating said first retainer portion being disconnected from said second retainer portion; and

wirelessly transmitting, by a wireless transceiver physically contained within a surface of at least one of said first retainer portion and said second retainer portion, said warning signal to a controller in a vehicle to activate an audible warning alert to warn a user in said vehicle of said first retainer portion being disconnected from said second retainer portion.

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